account of the examination of two idiots' brains preserved in the museum of St. Bartholomew's Hospital, and also of a series of wax models of fœtal brains in the museum of Guy's Hospital.

The result of the additional information so obtained is entirely to confirm the descriptions and explanations given of the structure and mode of formation of the idiot brain.

XXIII. "On Fermat's Theorem of the Polygonal Numbers." By the Right Hon. Sir Frederick Pollock, F.R.S., Lord Chief Baron. Received June 18, 1863.

[An abstract will be given in a future Number.]

Communications received since the end of the session.

I. "On Mauve or Aniline-Purple." By W. H. Perkin, Esq., F.C.S. Communicated by J. Stenhouse, LL.D., F.R.S. Received August 19, 1863.

(Abstract.)

The discovery of this colouring matter in 1856, and its introduction as a commercial article, have originated that remarkable series of compounds known as Coal-tar colours, which have now become so numerous, and, in consequence of their adaptability to the arts and manufactures, are of such great and increasing importance. The chemistry of mauve may appear to have been rather neglected, its composition not having been established, although it has formed the subject of several papers by continental chemists. Its chemical nature also has not been generally understood; and it is to this fact that many of the discrepancies between the results of the different experimentalists who have worked on this subject are to be attributed.

On adding a solution of hydrate of potassium to a boiling solution of commercial crystallized mauve, it immediately changes in colour from purple to a blue violet, and, on standing, deposits a crystalline body, which, after being washed with alcohol and then with water, presents itself as a nearly black glistening body, not unlike pulverized specular iron ore.

This substance is a base which I propose to call *Mauveine*: it

dissolves in alcohol, forming a violet solution, which immediately assumes a purple colour on the addition of acids. It is insoluble, or nearly so, in ether and benzole. It is also a very stable body, and decomposes ammoniacal salts readily. When heated strongly it decomposes, yielding a basic oil. Its analysis has led to the formula

$$C_{27}{}^{*}\,H_{24}\,N_4.$$

Hydrochlorate of Mauveine.—This salt is prepared by the direct combination of mauveine with hydrochloric acid. From its boiling alcoholic solution it is deposited in small prisms, sometimes arranged in tufts, possessing a brilliant green metallic lustre. It is moderately soluble in alcohol. Carbon, hydrogen, nitrogen, and chlorine determinations have led to the formula

$$C_{27}\,H_{24}\,N_4\,HCl.$$

I have endeavoured to obtain a second hydrochlorate, but up to the present have not succeeded.

Platinum-Salt.—Mauveine forms a perfectly definite and beautifully crystalline compound with bichloride of platinum, which, if prepared with warm solutions, separates in the form of crystals of considerable dimensions. It possesses the green metallic lustre of the hydrochlorate, but on being dried assumes a more golden colour. It is very sparingly soluble in alcohol. The analysis of this salt has led to the following formula,

$$C_{27}\,H_{24}\,N_4,\ HPt\,Cl_3.$$

Gold-Salt.—This substance separates as a crystalline precipitate, which, when moist, presents a much less brilliant aspect than the platinum derivative; it is also more soluble in alcohol than that salt, and when recrystallized appears to lose a small quantity of gold. Its analysis has given numbers agreeing with the formula

$$C_{27}\,H_{24}\,N_4,\ H\,Au\,Cl_4.$$

Hydrobromate of Mauveine.—This salt is prepared in a similar manner to the hydrochlorate, which it very much resembles, except that it is less soluble. Carbon, hydrogen, and bromine determinations give results agreeing with the formula

$$C_{27}\,H_{24}\,N_4,\ H\,Br.$$

Hydriodate of Mauveine.—In preparing this salt from the base, it

* C=12.

is necessary to use hydriodic acid which is colourless, otherwise the free iodine will slowly act upon the new product. It crystallizes in prisms, having a green metallic lustre. It is more insoluble than the hydrobromate. Its analysis has led to the formula

$$C_{27}H_{24}N_4, HI.$$

Acetate of Mauveine.—This salt is best obtained by dissolving the base in boiling alcohol and acetic acid. It is a beautiful salt, crystallizing in prisms possessing the green metallic lustre common to most of the salts of mauveine. Combinations of this substance gave numbers agreeing with the formula

$$C_{24}H_{24}N_4, C_2H_4O_2.$$

Carbonate of Mauveine.—The tendency of mauveine to combine with carbonic acid is rather remarkable. If a quantity of its alcoholic solution be thrown up into a tube containing carbonic acid over mercury, the carbonic acid will be quickly absorbed. To prepare the carbonate, it is necessary to pass carbonic acid gas through boiling alcohol containing a quantity of mauveine in suspension; it is then filtered quickly, and carbonic acid passed through the filtrate until cold; on standing, the carbonate will be deposited as prisms having a green metallic lustre. This salt, on being dried, gradually loses carbonic acid. From experiments that have been made with this salt, it would appear to have the composition of an acid carbonate, viz.

$$C_{27}H_{24}N_4, H_2CO_3.$$

In the analysis of salts of mauveine great care has to be taken in drying them thoroughly, as most of them are highly hygroscopic.

I am now engaged with the study of the replaceable hydrogen in mauveine, which I hope will throw some light upon its constitution. From its formula, I believe it to be a tetramine, although up to the present I have not obtained any definite salts with more than one equivalent of acid. Mauveine, when heated with aniline, produces a blue colouring matter, which is now under investigation. A salt of mauveine, when heated alone, also produces a violet or blue compound.